

being unpatentable over Gove; and objected to claims 3, 5, 14, and 16 as being dependent upon rejected base claims.

By this amendment, Applicants propose to correct a grammatical error in claim 2.

Regarding the rejection of claim 2 as being unpatentable over Gove, Applicant respectfully traverses this rejection. Claim 2 is directed to a combination of elements including an overlap determination means for determining whether or not a physical object present in virtual space is located between the visual point and the subject should overlap and be visible from the visual point.

The Examiner argues that:

since Gove teaches displaying a computer generated image of a subject (the vein) which is obscured by a physical object (the skin of the hand) and determine that the displayed subject in the nearby region of a physical object (the entrance path) (col. 4, lines 34-36), Gove inherently teaches an over-lapped determining means which determines displayed subject (the displayed vein) under a physical object (the skin) and displaying the obstructed subject using a show-through means. Further Gove teaches a non-show through processing (col. 4, lines 13-17). It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to use the non show through feature taught by Gove to display virtual image as claimed.

The Examiner's reliance upon the theory of inherency is simply untenable.

According to M.P.E.P. § 2112, "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic In relying upon the theory of inherency, the examiner must provide a basis in fact/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of applied prior art."

There is no reasonable basis for assuming that the system of Gove necessarily

included a means for determining overlap. The objects discussed by Gove include a nerve 86, a foreign object 80 and an entrance path 88. All of these objects are, by definition, internal to the hand. The entire point of the Gove invention is to display objects to a viewer that are found within the body of the patient. Not only does the system not "necessarily" include a means for determining whether there is overlap, there would be no need to determine whether objects within a person are overlapped, because, by definition they are.

Further, even if an overlap determining means were "inherent" to Gove, the Gove specification does not enable one skilled in the art to make and or use an overlap determining means. According to M.P.E.P. § 2121.01, "[i]n determining that quantum of prior art disclosure which is necessary to declare an applicant's invention 'not novel' or 'anticipated' within section 102, the stated test is whether a reference contains an 'enabling disclosure.'" The Examiner has rested the rejection of claim 2 solely upon Gove, however, this reference does not disclose in any meaningful sense a determining means as claimed. By stating that the determining means is inherent to Gove, the Examiner has disregarded the fact that no such determining means was disclosed, let alone enabled by the reference. While the enablement requirement is not a heavy substantive burden, the complete lack of even an allusion to such a structure in the Gove disclosure obviates the Examiner's reliance upon this "inherent" element.

Still further, claim 2 requires a physical object present in virtual space. The definition of a physical object in a virtual space is given, for example, at page 3, lines 19-20, as "(virtual terrain, obstacles, irregular terrain surfaces, and the like) present in the virtual space." A physical object present in virtual space is, by definition, internal to

RECEIVED
DEC 30 1995
2:00 PM
ROOM

LAW OFFICES

FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000

a computer, as tangible objects cannot be present in a virtual space. Applicant notes that according to M.P.E.P. § 2173.01 "[a] fundamental principle contained in 35 U.S.C. § 112, second paragraph is that applicants are their own lexicographers." The Examiner, in derogation of the clear definition of "a physical object present in virtual space" both in the recitation of claim 2 and in the specification, argues that this term is anticipated by the skin of a hand as disclosed by Gove. The Examiner is entitled to give the broadest reasonable definition to a claim term, however, by no reasonable definition is the skin of a hand a physical object present in virtual space. As shown in Fig. 5 of Gove, the skin of the hand is not displayed, i.e., is not located in virtual space, but rather is seen with the pixels from LCD 67 superimposed on the corporeal hand of the person to be operated on.

Claim 2 also requires an image generation means for generating virtual images using show-through processing when objects overlap and non-show-through processing when there is no overlap. The Examiner fails to cite any portion of the Gove specification as teaching show-through processing and cites column 4, lines 13-17 as teaching non-show-through processing. Presumably the Examiner is citing the embodiment of Fig. 2 as teaching show-through processing.

As discussed above, non-show-through processing is used when the objects are in a state other than an overlapping state. The section of the Gove specification relied upon by the Examiner reads: "The use of an LCD instead of the reflective lens of FIG. 2 attenuates more of the light from the image and reduces the visibility of the viewer. Areas of interest may be marked by attenuating light from the areas of interest, or by attenuating light from all areas except those of interest." This is not a separate form of

RECEIVED
DEC 30 1999
FEDERAL MAIL ROOM

LAW OFFICES

FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000

processing that is applied when overlap occurs as claimed, but rather relates to a distinct method of displaying image data. Instead of projecting an image onto a semi-transparent lens 50 as shown in Fig. 2, light entering mask 69 through LCD 67 is blocked by activation of the LCD elements. The processing for the two embodiments is the same, and in both embodiments it is internal structures that are displayed, such that no distinction in display of obscured or non-obscured objects occurs. Further, even if the embodiment of Fig. 2 could be reasonably defined as "show-through processing" and the embodiment of Fig. 3 could be reasonably defined as "non-show-through processing," there is no switching back and forth between the embodiments of Fig. 2 and Fig. 3 depending on whether there is overlap.

Regarding the rejection of claim 4, the Examiner argues that Gove inherently teaches that the overlap determination means compares displacement from a prescribed ground point for a first reference point previously specified for the subject with displacement from a ground point for a second reference point previously specified for said physical object, and, in the event that the displacement for the first reference point is smaller than the displacement for the second reference point, decides that an overlapping state exists, or, in the event that the displacement for the first reference point is greater than the displacement for the second reference point, decides that a non-overlapping state exists.

The line of reasoning provided by the Examiner is that the system of Gove inherently has an overlap determination means, and that because the system inherently has such a means, it must operate in the same manner as that claimed by Applicant. As noted above, in order to support a finding of inherency, it is not sufficient to show

that something could have been done, but rather the burden of proof is that it necessarily was done. Even if an overlap determination means were inherent to the disclosure of Gove, there is simply no support for the argument that such a means necessarily operated as claimed. The Examiner has placed Applicant in the position of distinguishing the undisclosed operation of an undisclosed structure. The line of reasoning applied by the Examiner far exceeds any permissible grounds for rejection.

Regarding claim 6, this claim is patentable, at least, in view of its dependence from claim 1. Claim 6 defines the show-through display as replacing pixels for displaying the physical object with pixels for displaying the subject according to a prescribed pattern. The element of Gove defined by the Examiner as comprising a physical object, however, is not comprised of pixels are required, but rather, is a corporeal object (the skin of a hand). Corporeal objects are not comprised of picture elements (pixels), but rather are comprised of protons, neutrons, and electrons. The surgical system of Gove, therefore, does render obvious Applicant's claimed invention.

Regarding claim 7, this claim depends from claim 6 and requires that the pattern comprises an alternating sequence of pixels for displaying the physical object and pixels for displaying the subject. Applicant has reviewed the Gove specification and finds no mention of an alternating sequence of pixels. Fig. 5 shows a hand (a physical object) seen through a display, where pixels relating to an image of a nerve 86, an entrance path 88, and a foreign object 80 are blocked by LCD elements. None of the virtual objects in Gove is disclosed as being comprised of alternating pixels. To find this limitation, the Examiner seems to suggest the display of not only the internal features of the hand of Fig. 5, but of the hand itself. There is no teaching or suggestion of

LAW OFFICES

FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, D. C. 20005
202-408-4000

displaying the hand in Gove. The idea is to have the surgeon see features internal to the hand superimposed on the actual hand. There is simply no teaching or suggestion in the reference of displaying the hand, let alone how the hand would be displayed.

Regarding the rejection of claim 9 as being unpatentable over Gove, Applicant respectfully traverses this rejection for essentially the same reasons expressed above with respect to claim 1. Further, Applicant reiterates that the claimed invention is directed toward displaying a physical object present in virtual space in two different forms of representation depending on the results of a determination step. If it is determined that the subject and the physical object are overlapping, the physical object is rendered using show-through processing. If, however, it is determined that the subject and the physical object are not overlapping, the physical object is not rendered show-through.

The Examiner argues that the skin of the hand of Gove is a physical object in virtual space. Again Applicant disagrees with this interpretation of Gove. The skin of the hand is by definition tangible and not virtual. Further, there is no virtual image of the hand. As shown in Fig. 5, of Gove, the surgeon will view the actual hand and not a virtual representation thereof. Still further, by definition, if the object of interest in Gove is not obscured by the skin of the hand, there is no need to process and display the object at all. If, for example, the surgeon were to operate on a mole on the surface of the skin of the hand, no reasonable person would then create a virtual image of the mole to overlay the actual mole for display to the surgeon. The system of Gove, by definition, is used only where the object of interest is not visible to the surgeon, and so, there is no need for non-show-through processing.

Regarding claim 9, this claim is patentable for essentially the same reasons expressed above with respect to claim 8.

Regarding the rejection of claims 10-12, these claims are patentable, at least, in view of their dependence from claims 2, 8, and 9 respectively.

Regarding claim 13, this claim is patentable for, at least, essentially the same reasons expressed above with respect to claim 2. Further, instead of using the term "physical objects present in said virtual space," claim 13 uses the term "objects present in said virtual space." Regardless of the Examiner's interpretation of the term "physical object," therefore, the hand of Gove is by no reasonable definition an object present in virtual space. For this additional reason, therefore, claim 13 is patentable over the applied reference.

Regarding claims 15, 17, and 18, these claims are patentable, at least, in view of their dependence from claim 13. Further, these claims are patentable for essentially the same reasons expressed above with respect to claims 4, 6, and 7.

Applicant respectfully requests that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 2-18 in condition for allowance. Applicant submits that the proposed amendment of claim 2 does not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

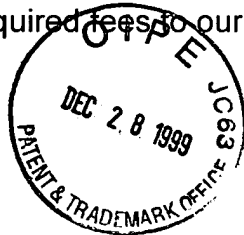
Furthermore, Applicant respectfully points out that the final action by the Examiner presented some new arguments as to the application of the art against

Applicant's invention. It is respectfully submitted that the entering of the Amendment would allow the Applicant to reply to the final rejections and place the application in condition for allowance.

Finally, Applicant submits that the entry of the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicant submits that the claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicant therefore requests the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.



Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

By: Walter F. Duncliff Reg. No. 24,914

for Richard V. Burgujian
Reg. No. 31,744

Dated: 12-28-99

LAW OFFICES

FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, D. C. 20005
202-408-4000